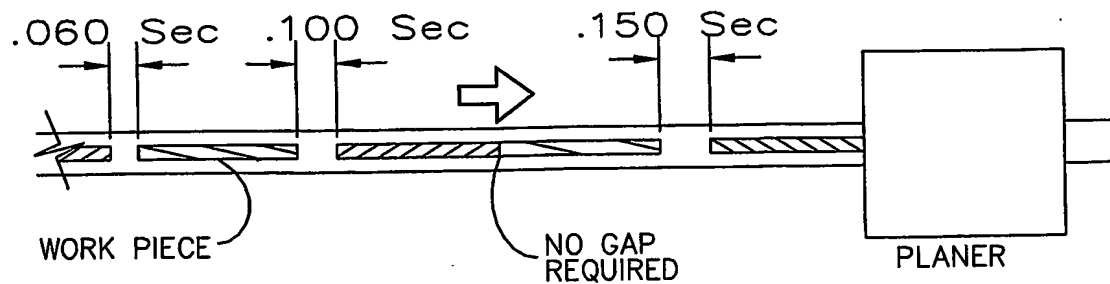
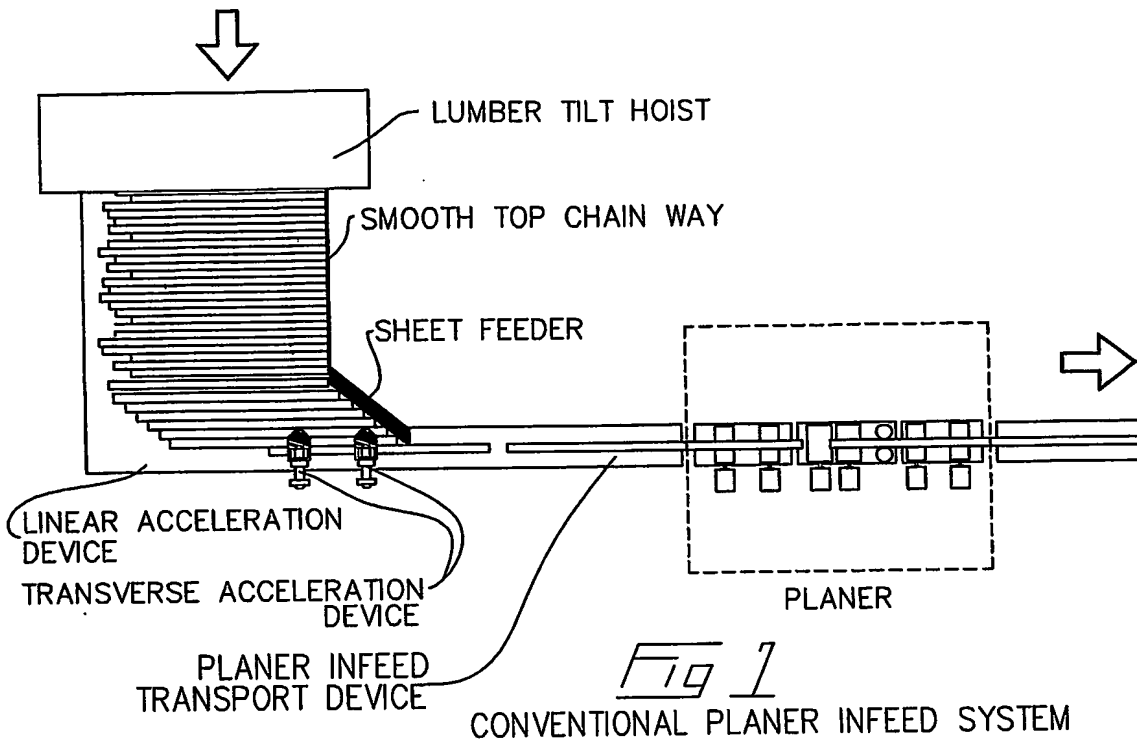


1/29



2/29

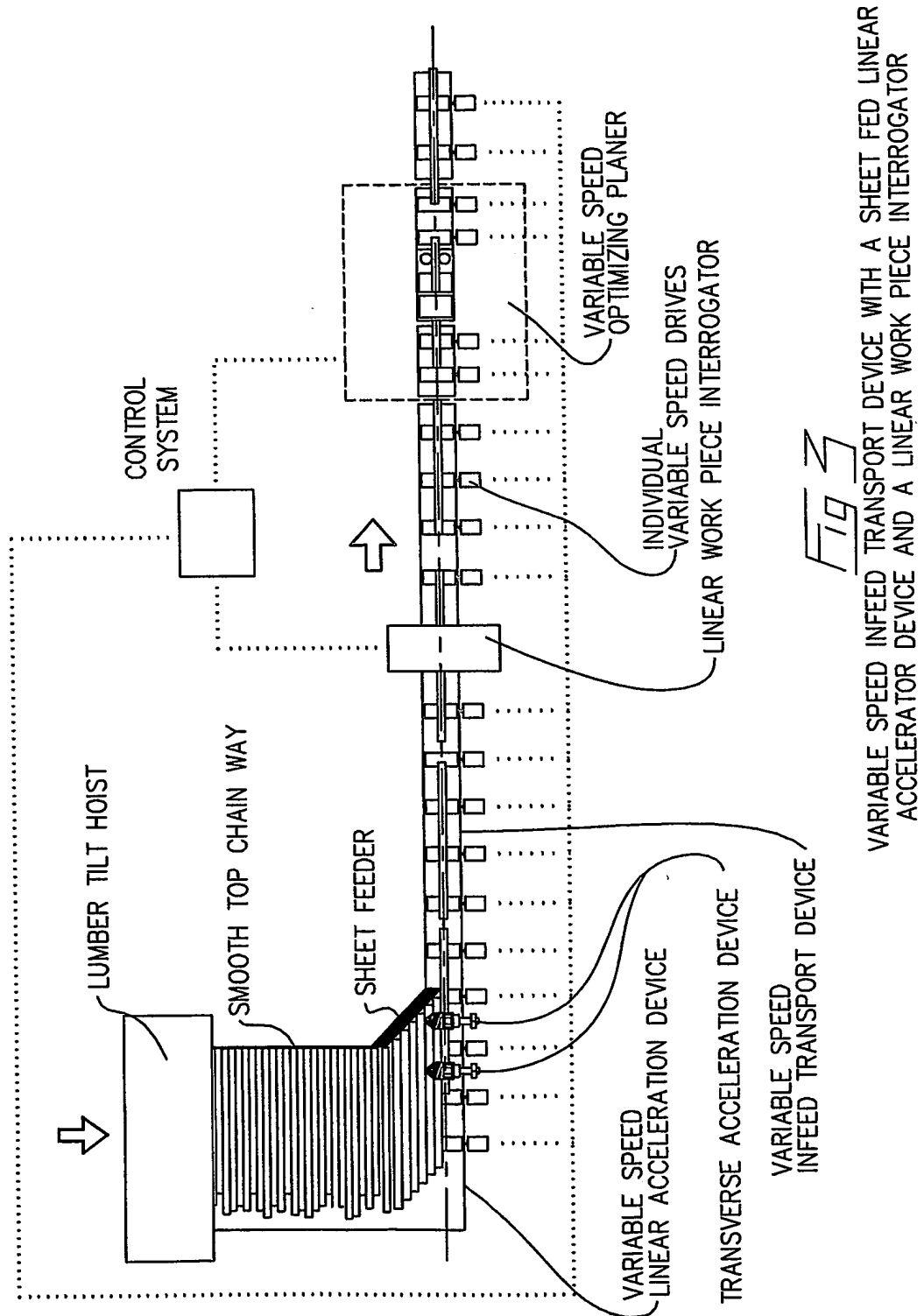


FIG 3

VARIABLE SPEED INFEED TRANSPORT DEVICE WITH A SHEET FED LINEAR ACCELERATOR DEVICE AND A LINEAR WORK PIECE INTERROGATOR

3/29

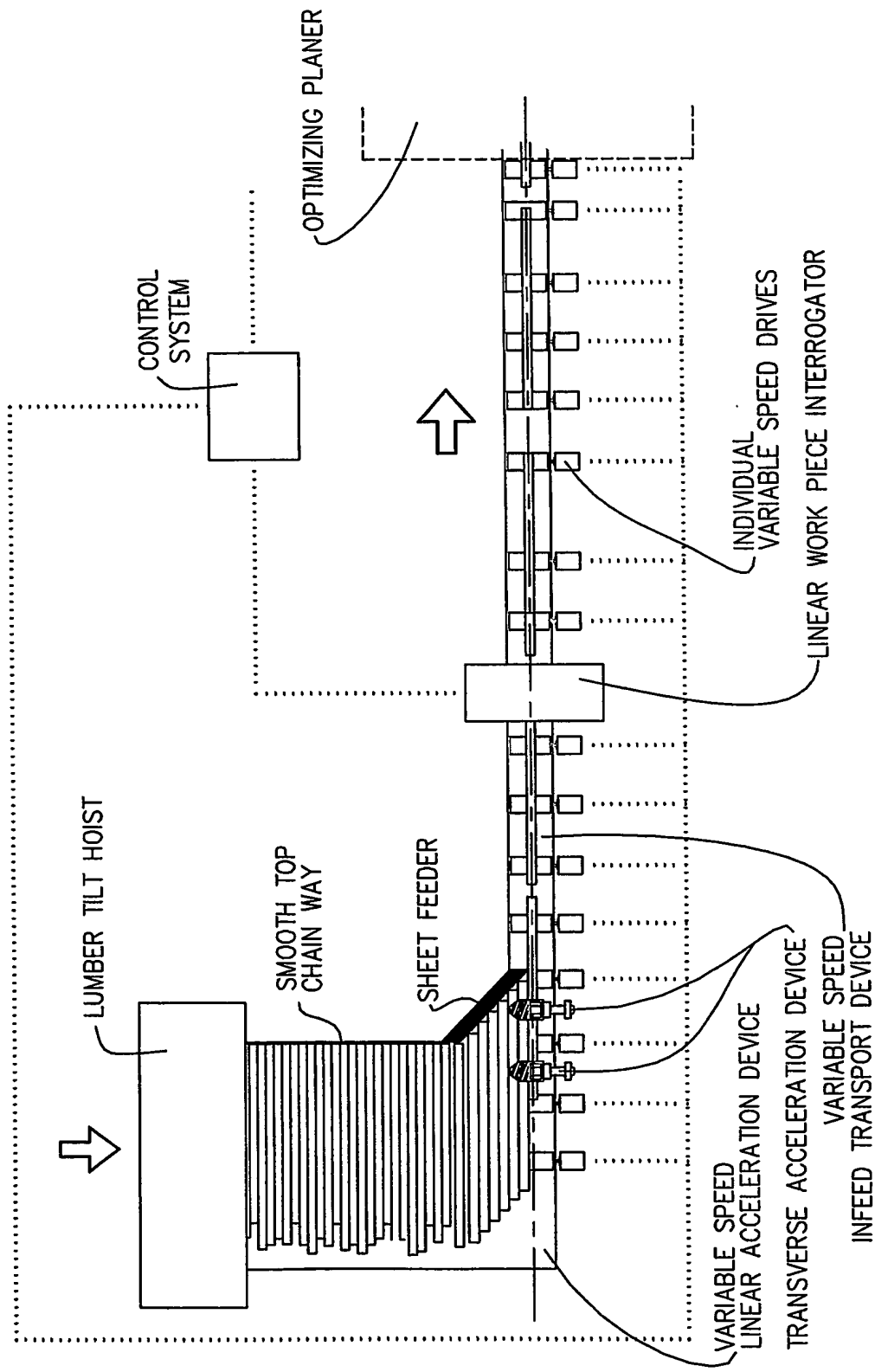


Fig 4

VARIABLE SPEED INFEED TRANSPORT DEVICE WITH A SHEET FED LINEAR ACCELERATION DEVICE AND A LINEAR WORK PIECE INTERROGATOR (WITH CLOSED LOOP NON OPTIMIZING CONTROL)

4/29

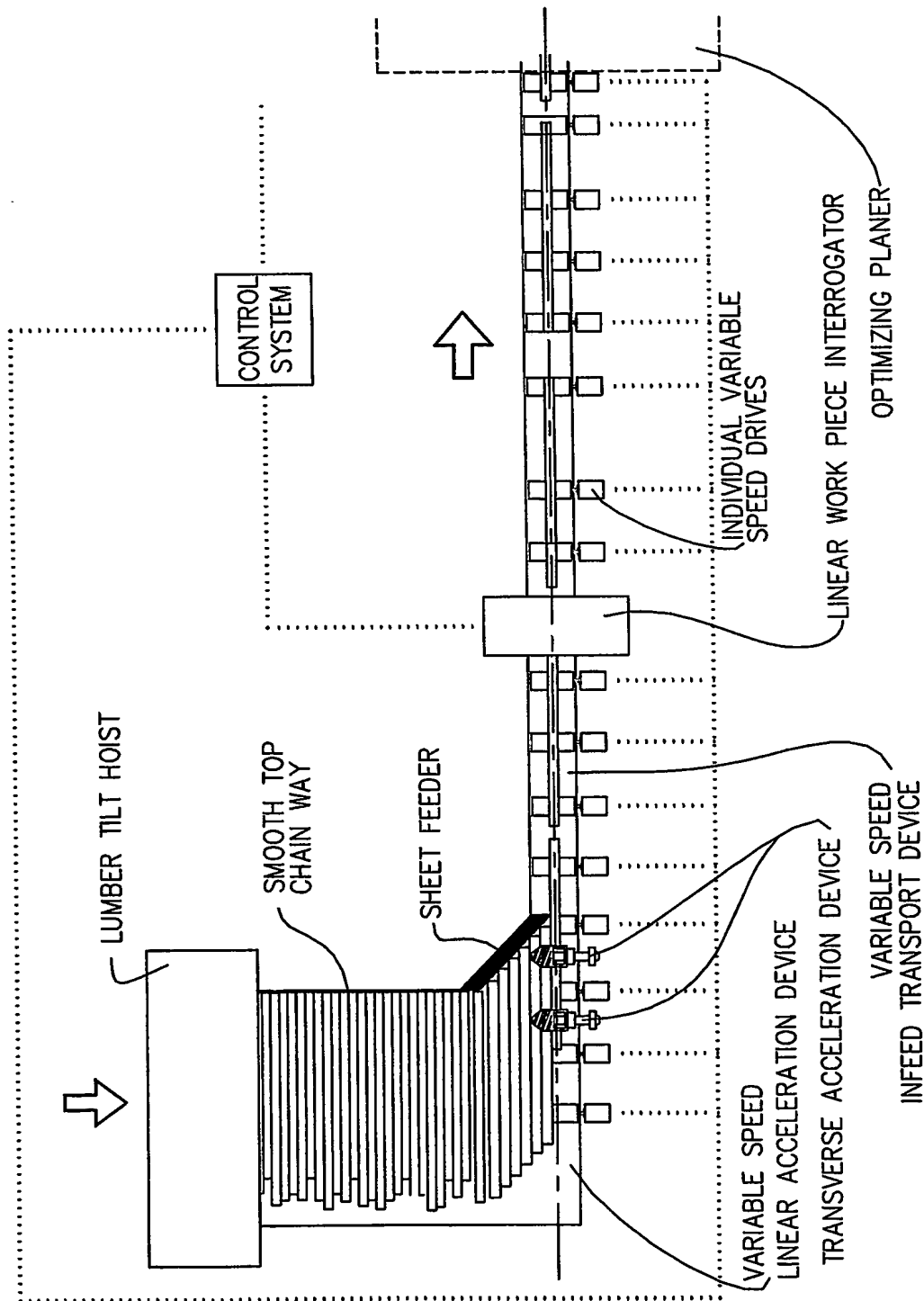


Fig 5

VARIABLE SPEED INFED TRANSPORT DEVICE WITH A SHEET FED LINEAR ACCELERATION DEVICE AND A LINEAR WORK PIECE INTERROGATOR (WITH CLOSED LOOP OPTIMIZING CONTROL)

5/29

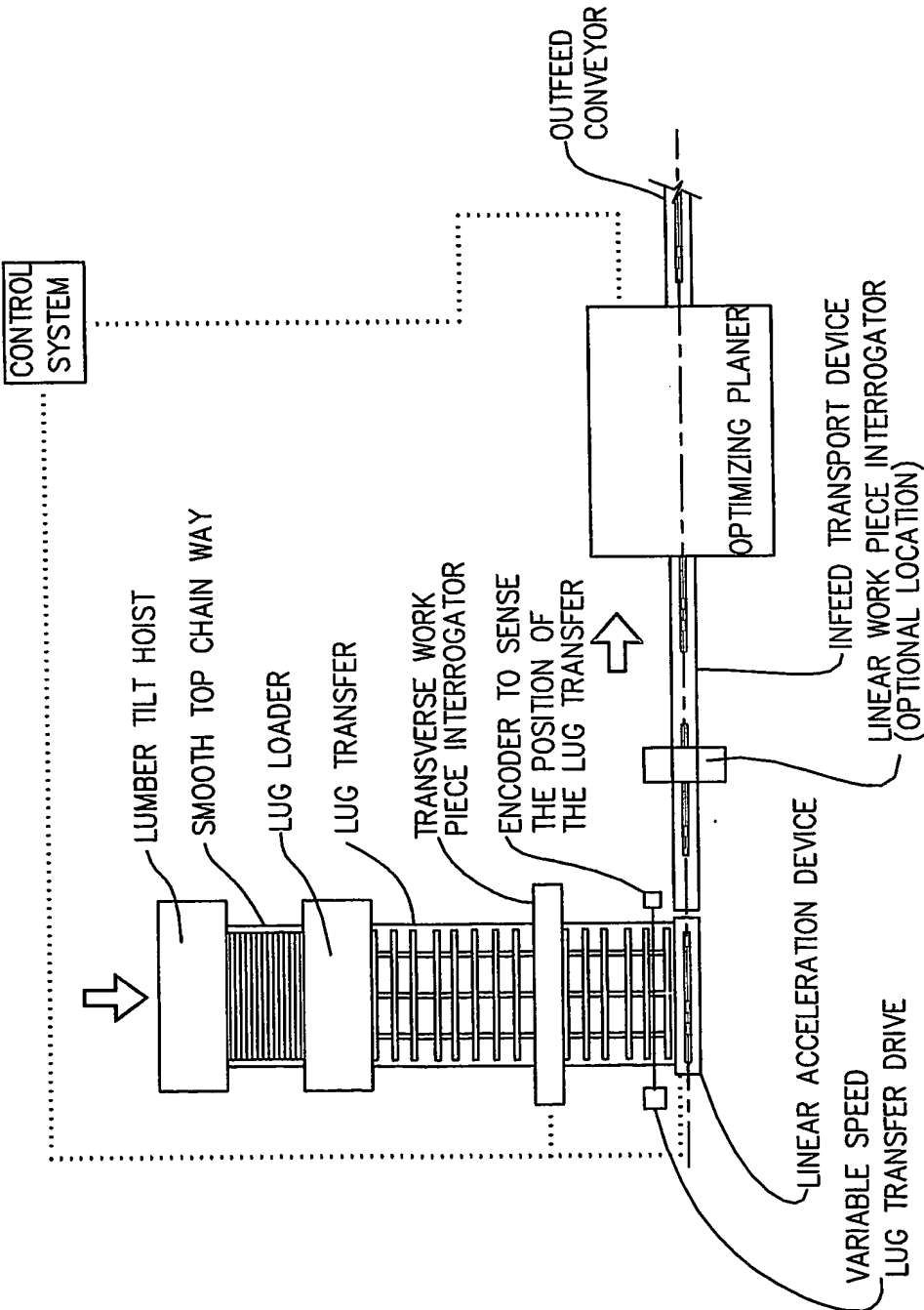


Fig 6

VARIABLE SPEED LUG TRANSFER WITH TRANSVERSE WORK PIECE INTERROGATOR
(SHOWN WITH OPTIONAL LINEAR WORK PIECE INTERROGATOR)

6/29

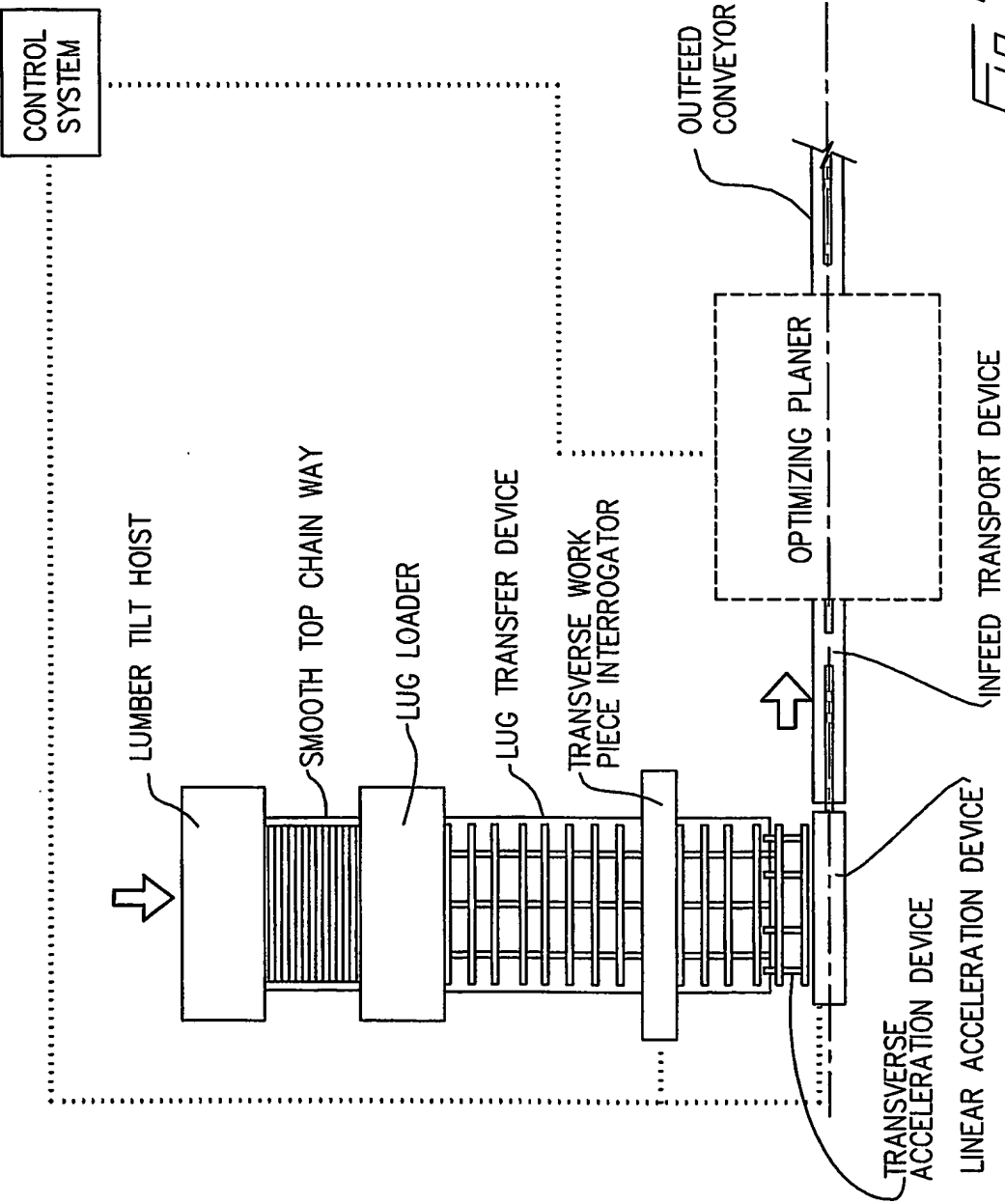


Fig 7

LUG TRANSFER DEVICE WITH TRANSVERSE ACCELERATION DEVICE

7/28

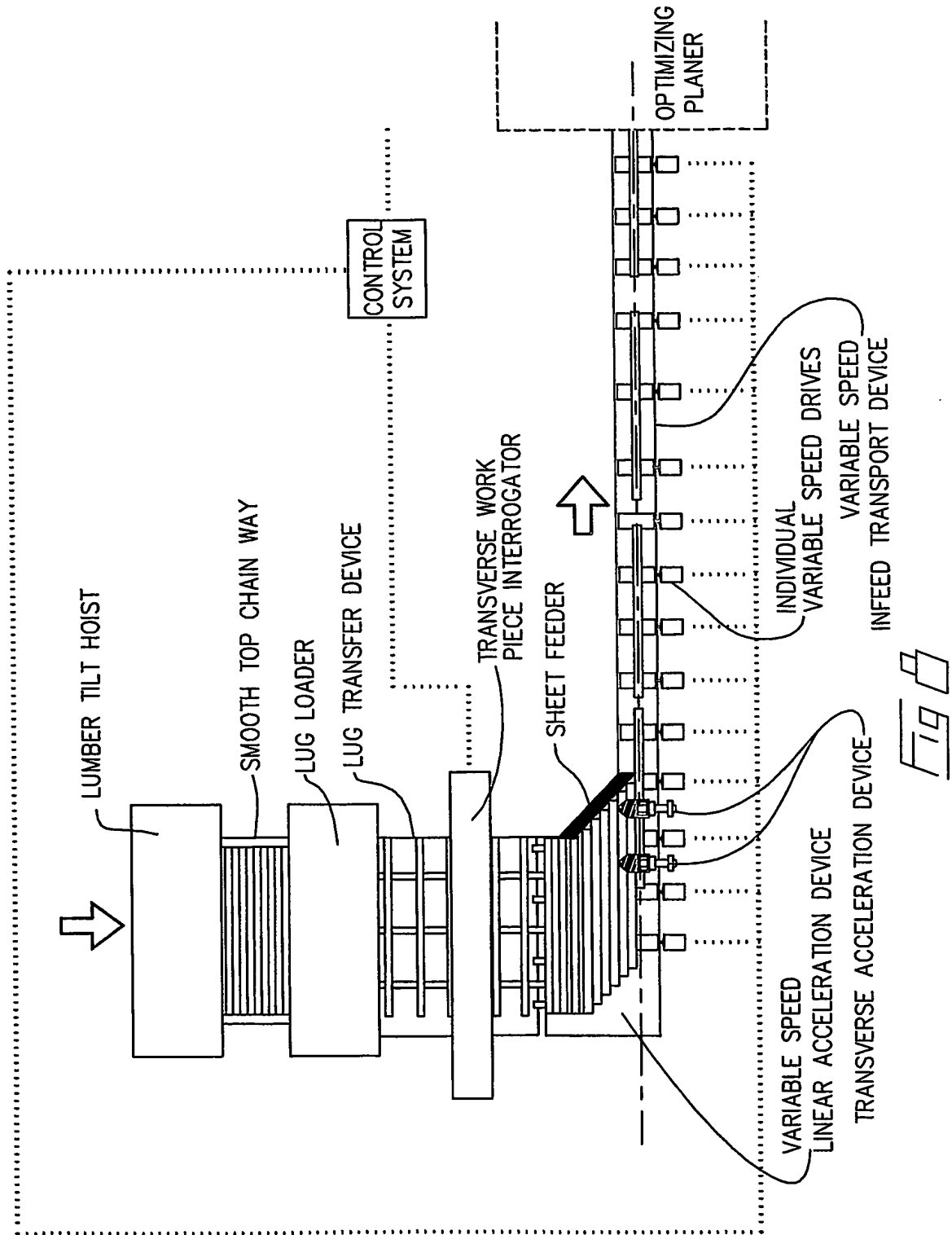
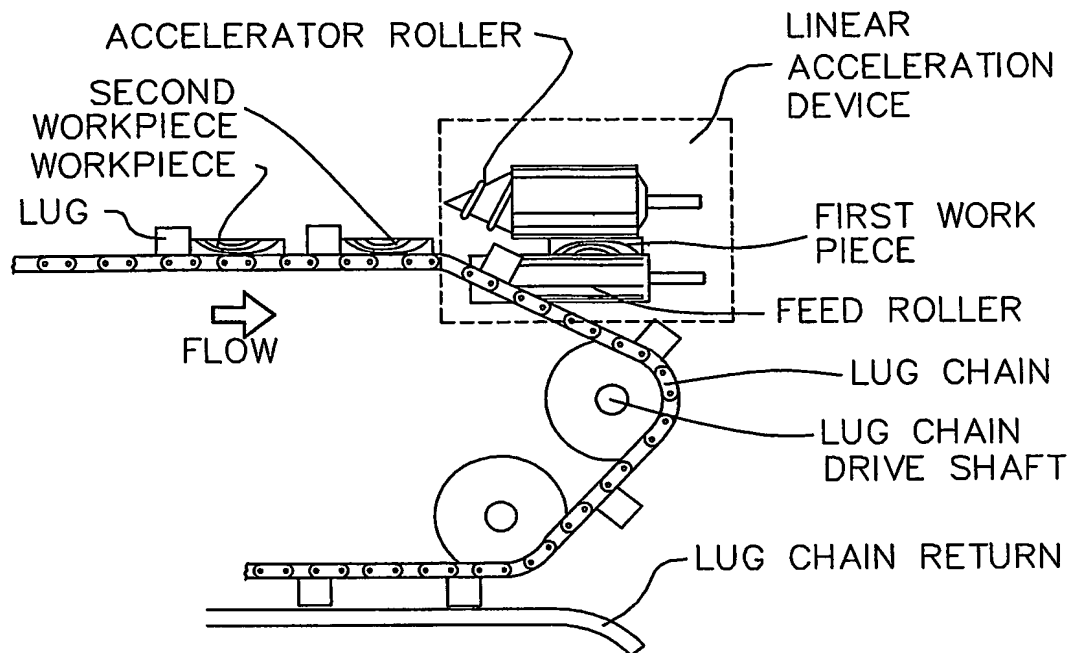
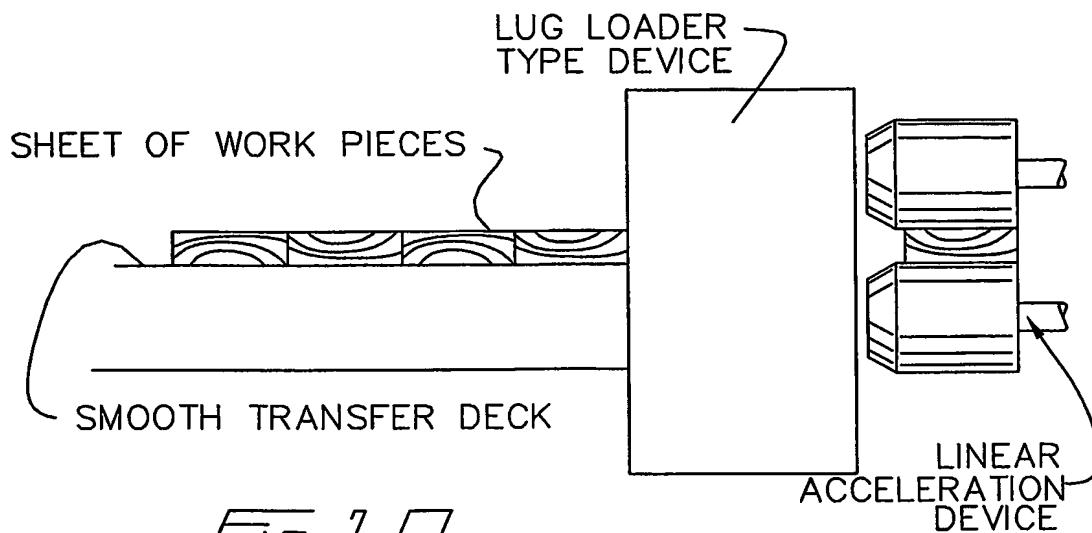


FIG 1
LUG TRANSFER DEVICE USED IN COMBINATION
WITH A SHEET FED VARIABLE SPEED LINEAR ACCELERATION DEVICE

8/29

*Fig 9*

LUG TRANSFER DEVICE FEEDING WORKPIECES
ONTO A LINEAR ACCELERATION DEVICE

*Fig 10*

LUG LOADER TYPE DEVICE SHEET FEEDER

9/29

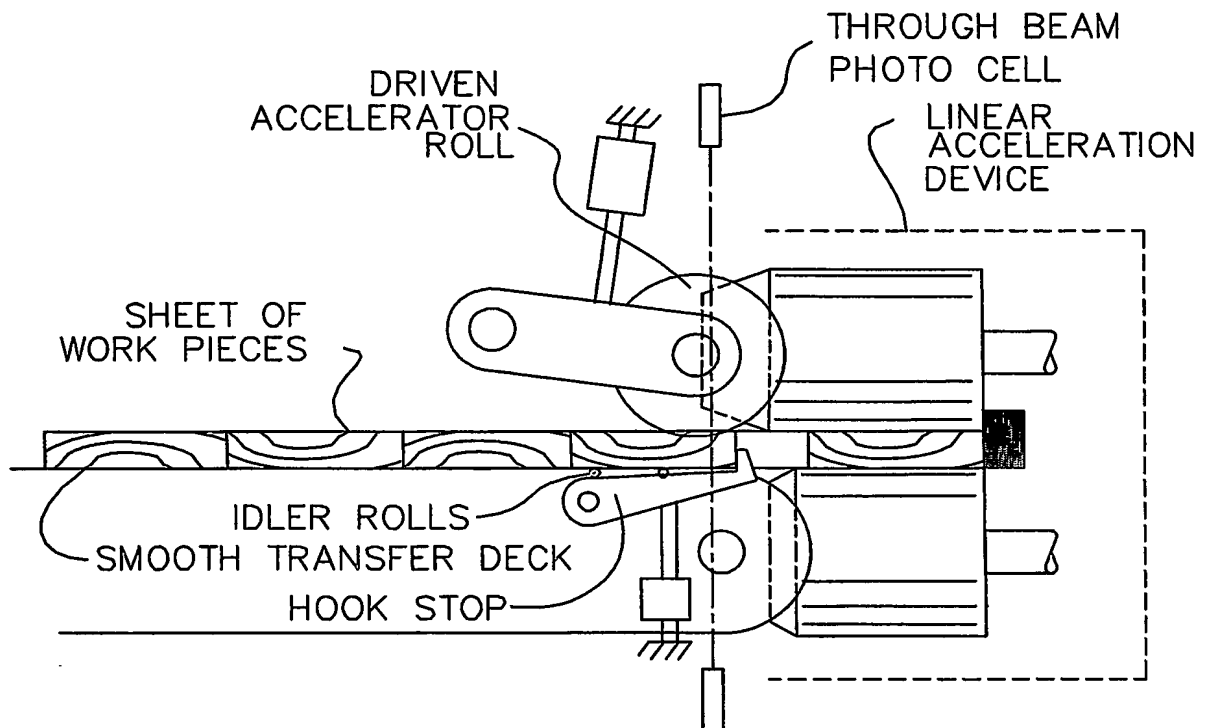
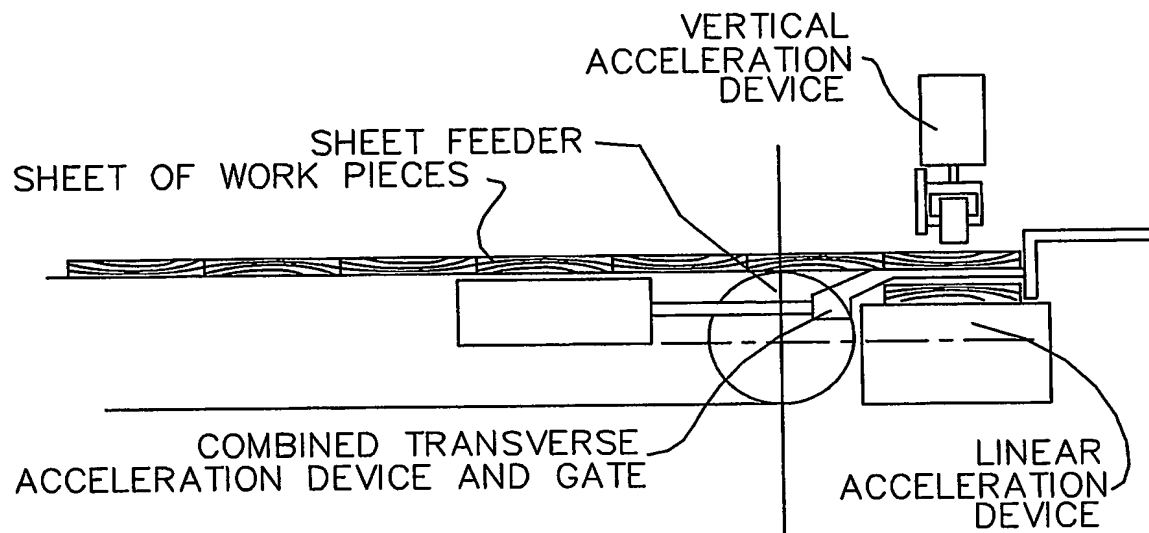
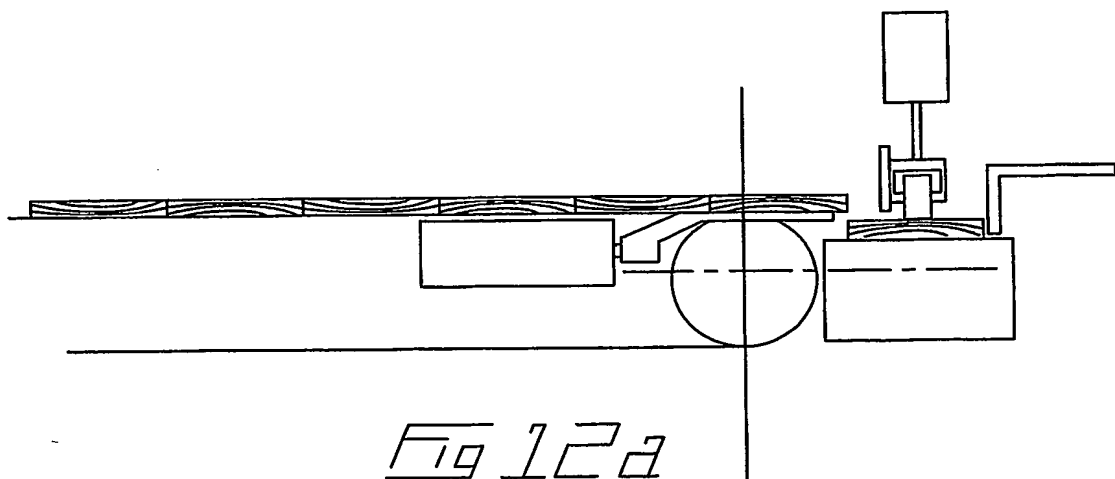


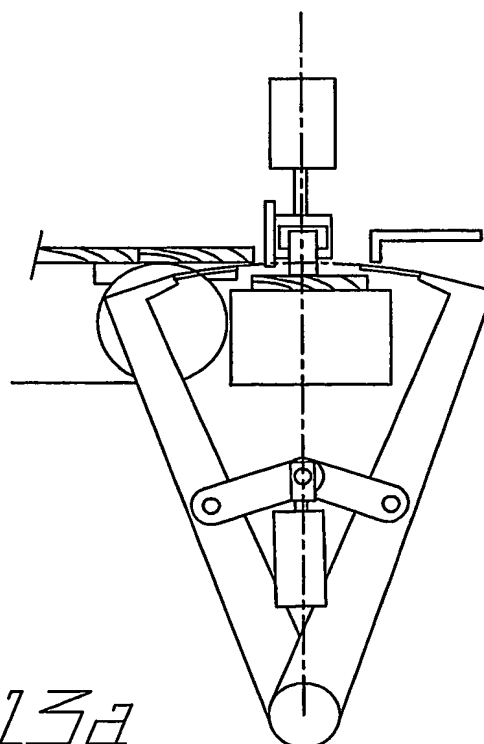
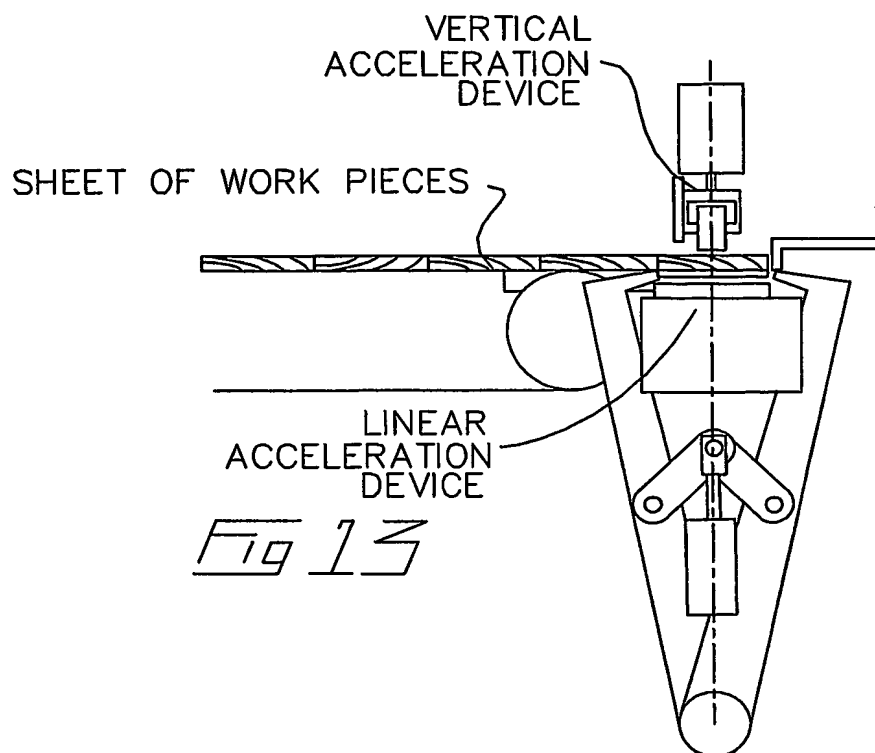
Fig 11
SHEET FEEDER

10/29

*Fig 12*

SHEET FED TRANSVERSE ACCELERATION DEVICE COMBINED WITH
VERTICAL ACCELERATION DEVICE AND LINEAR ACCELERATION DEVICE

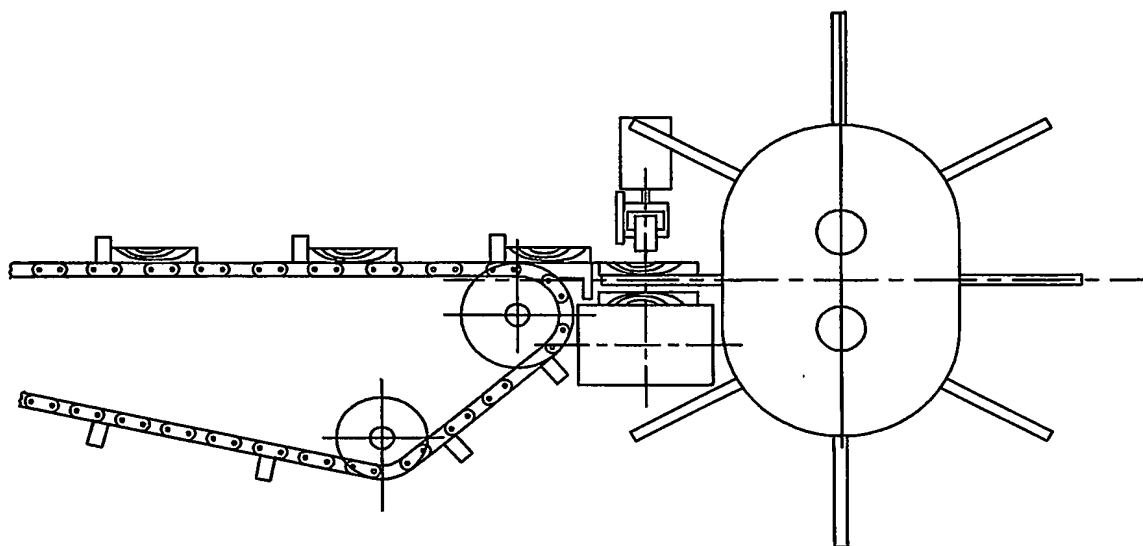
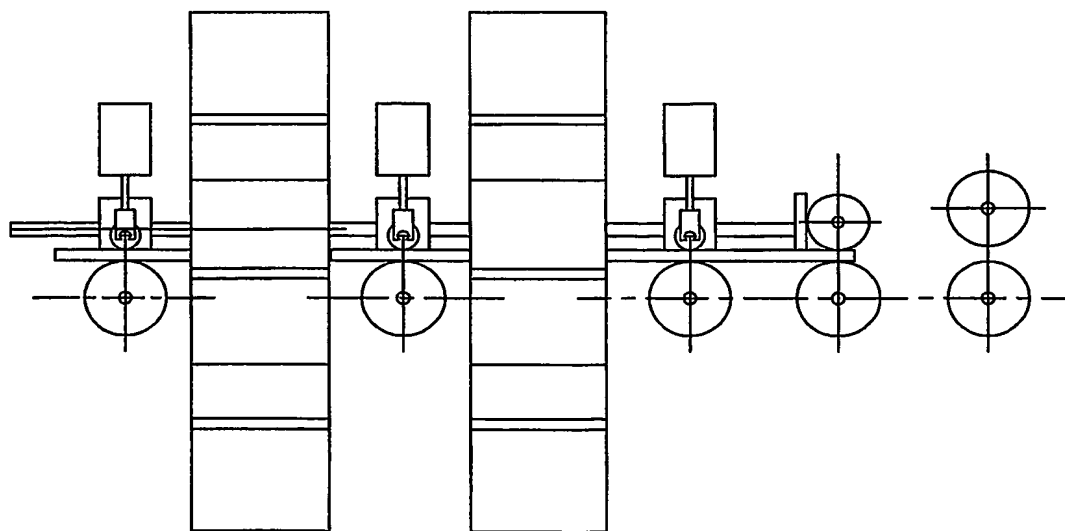
11/29



ALTERNATE SHEET FED VERTICAL ACCELERATION

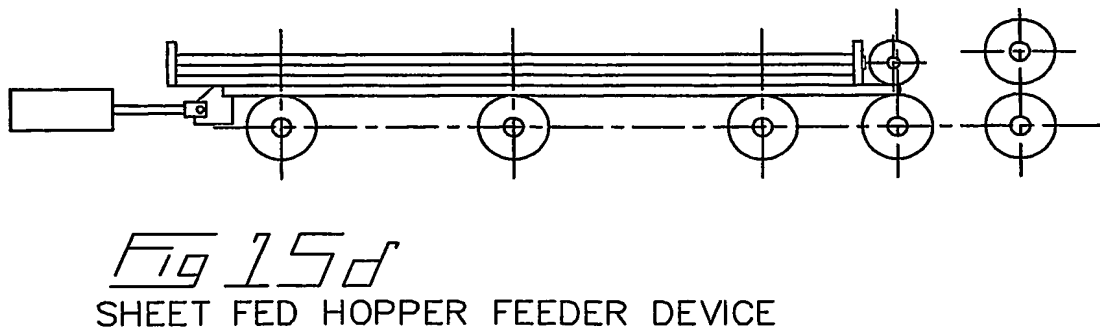
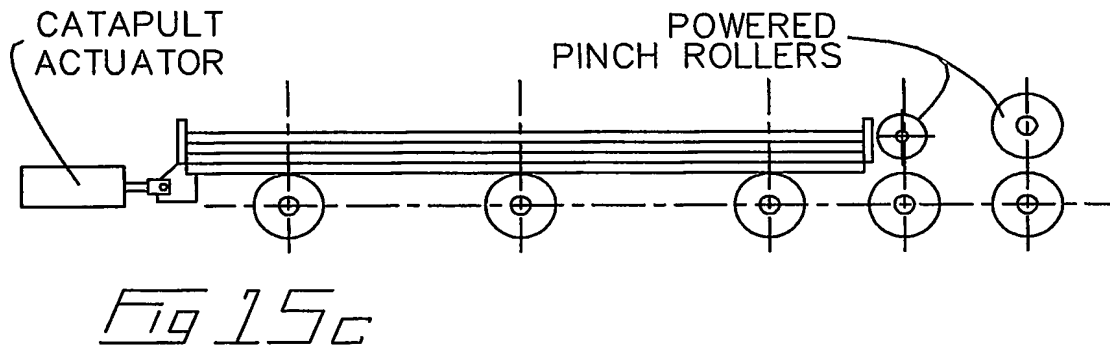
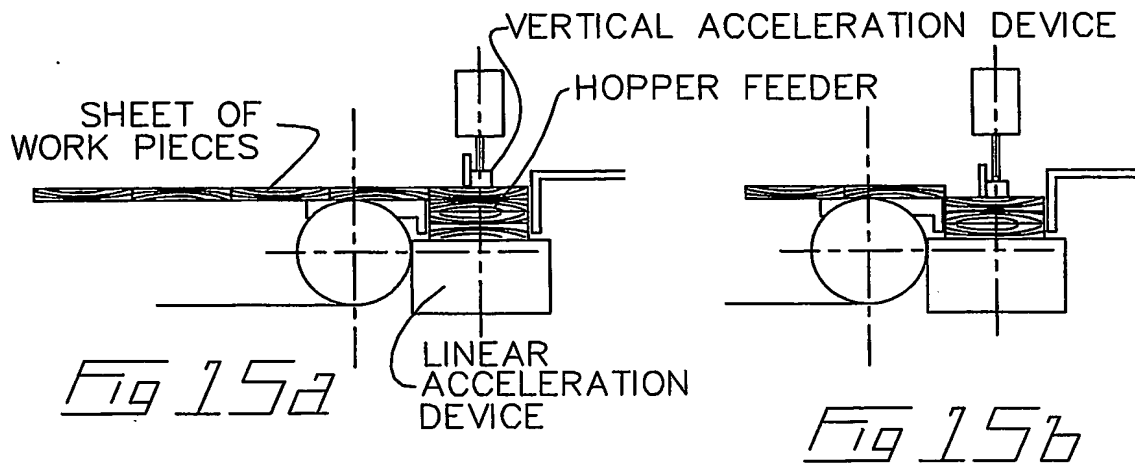
SUBSTITUTE SHEET (RULE 26)

12/29

*Fig 14**Fig 14a*

CONTINUOUS INDEXABLE SUPPORT ARM
VERTICAL ACCELERATION DEVICE

13/29



14/29

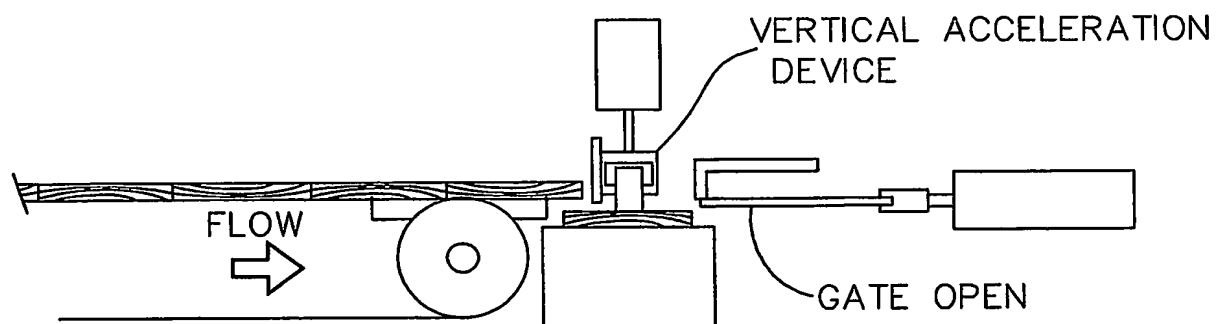
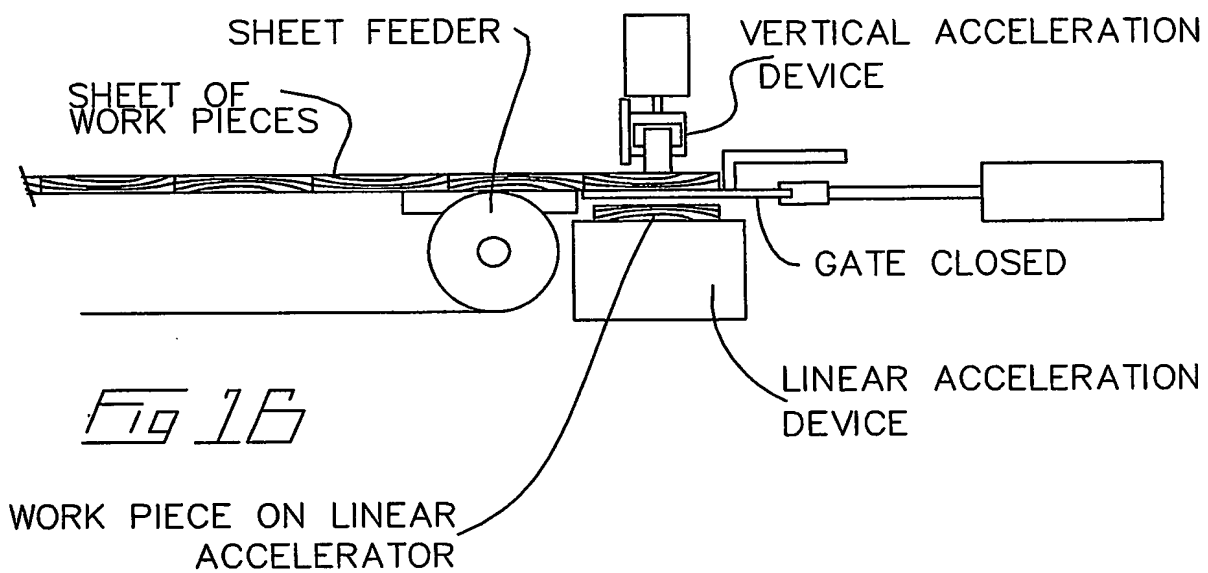


Fig 16a

SHEET FED VERTICAL ACCELERATION DEVICE

15/29

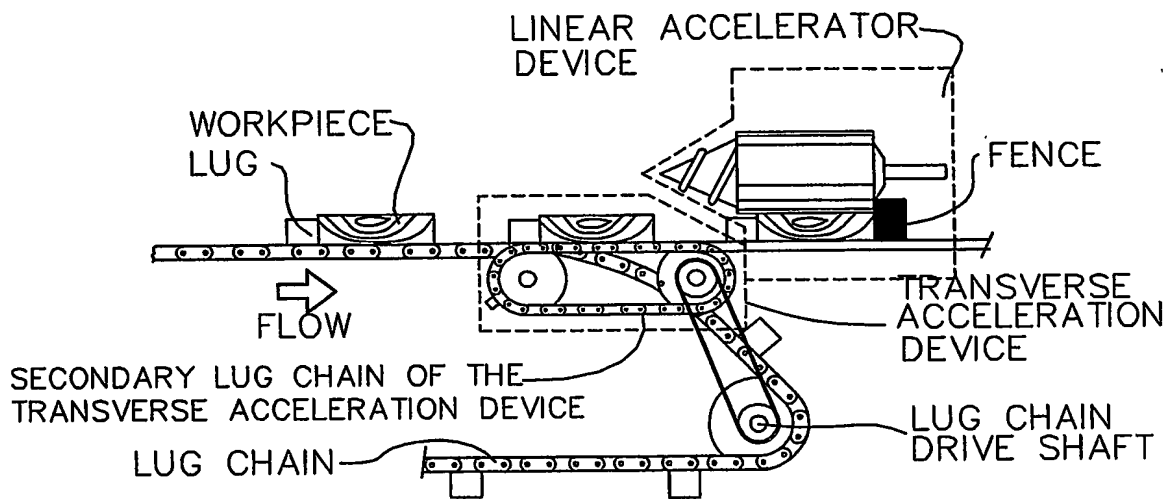


Fig 17
TRANSVERSE ACCELERATION DEVICE
FEEDING LINEAR ACCELERATION DEVICE

16/29

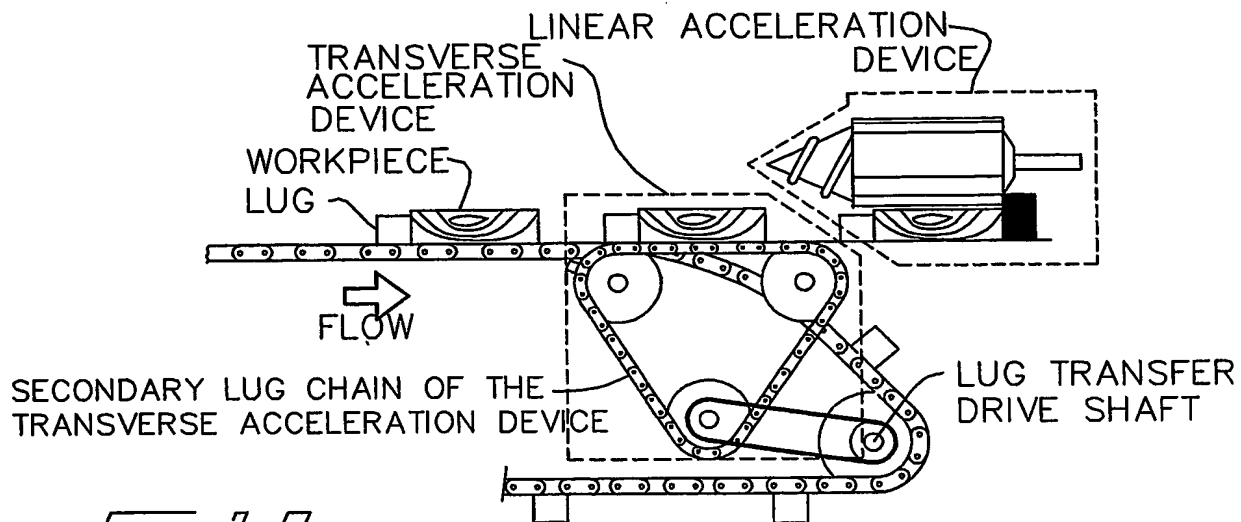


Fig 18

TRANSVERSE ACCELERATION DEVICE
FEEDING LINEAR ACCELERATION DEVICE

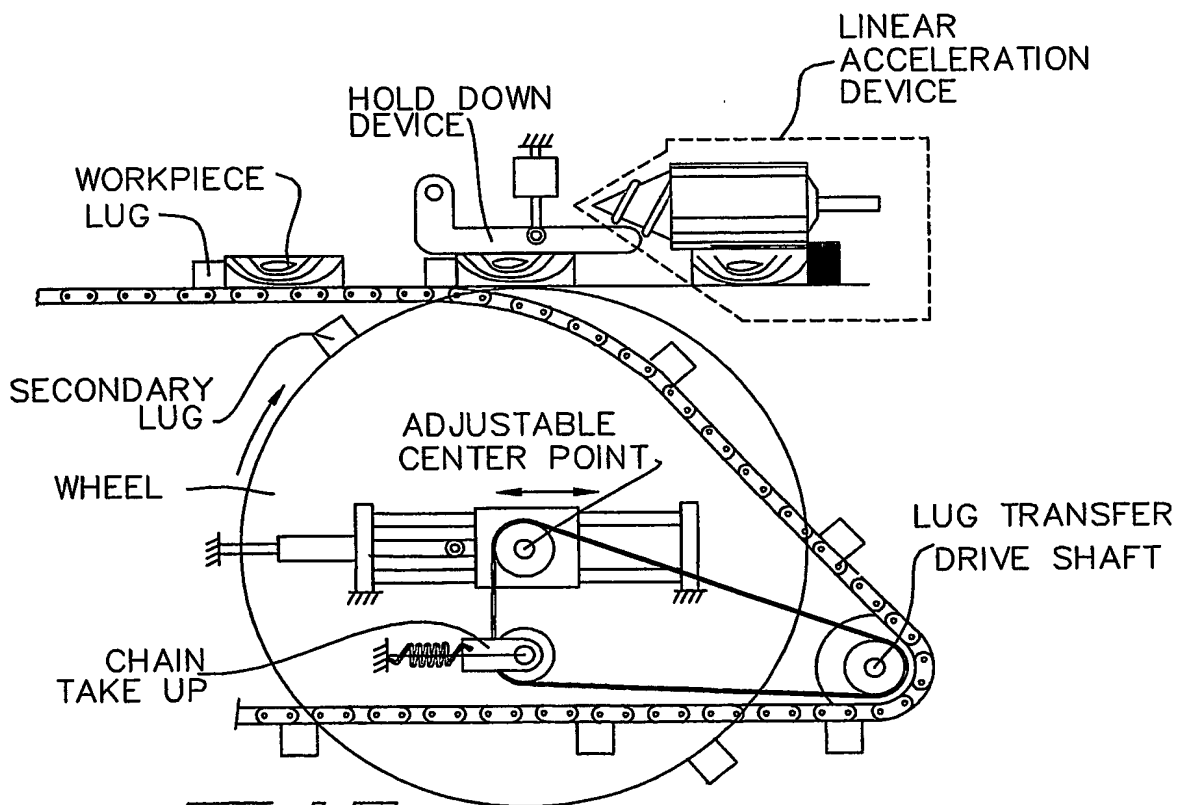


Fig 19

TRANSVERSE ACCELERATION DEVICE
ADJUSTABLE WHEEL TYPE

17/29

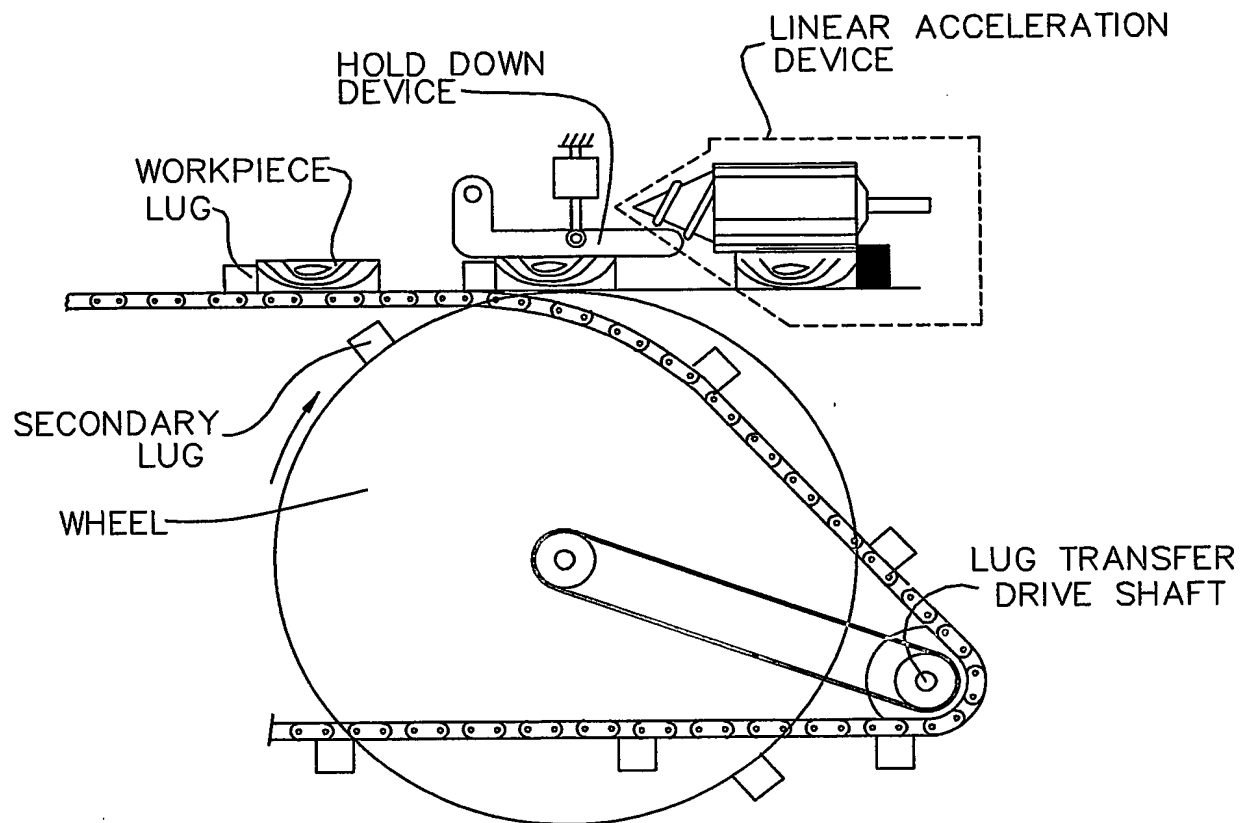


Fig 20
TRANSVERSE ACCELERATION DEVICE

18/29

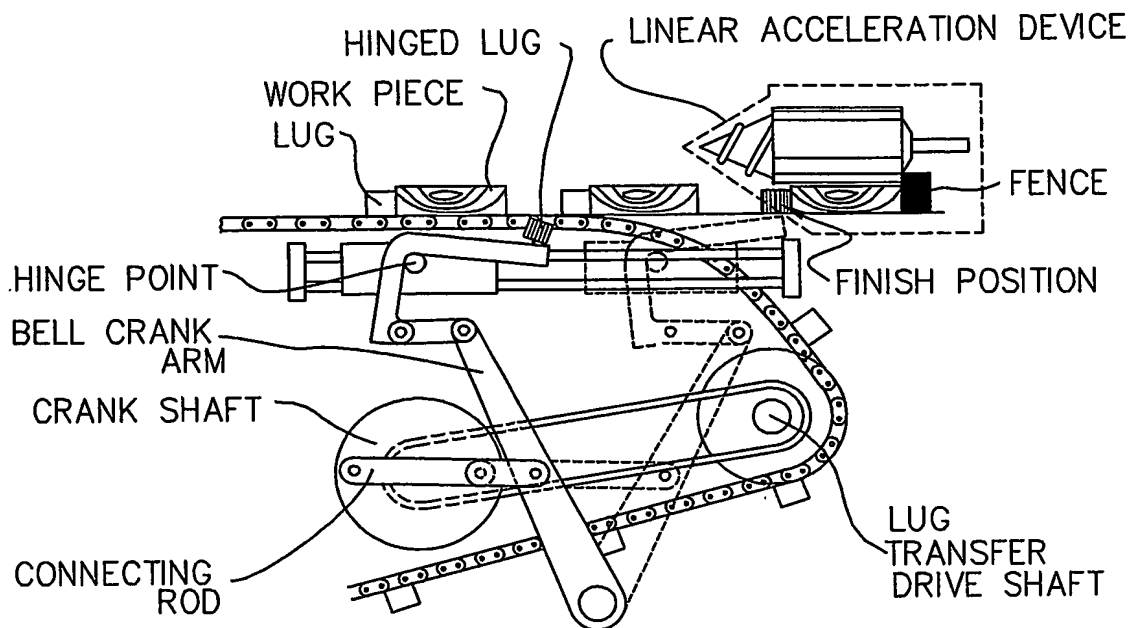


Fig 21

TRANSVERSE ACCELERATION DEVICE
SLIDER CRANK TYPE

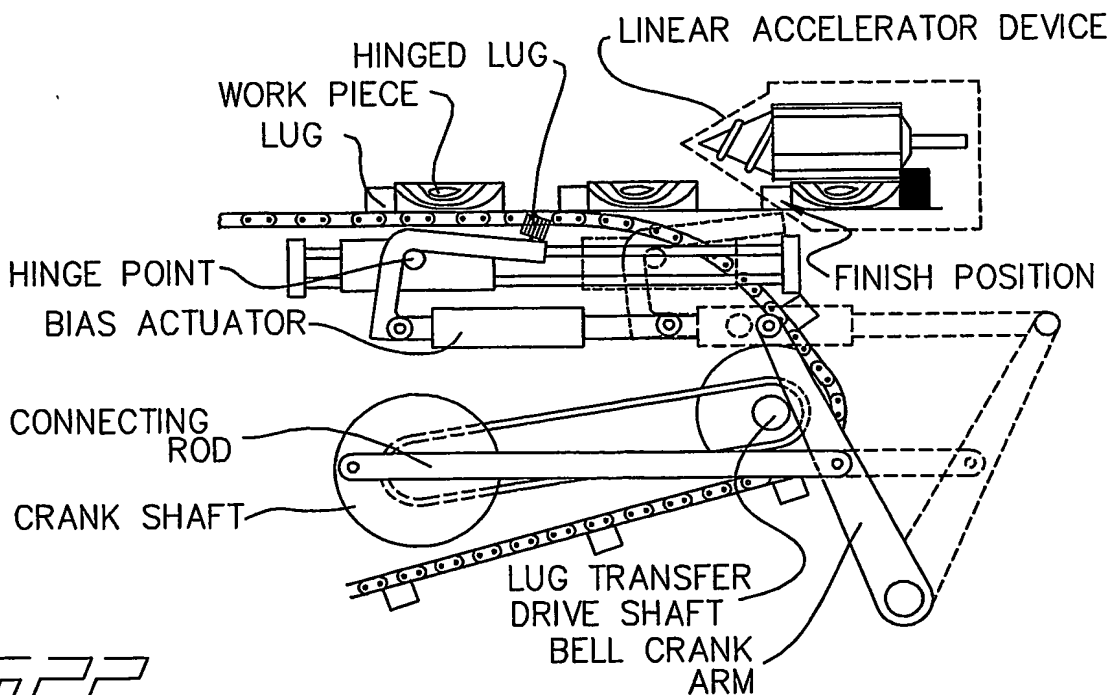


Fig 22

TRANSVERSE ACCELERATION DEVICE WITH
ADJUSTABLE START STOP POINTS

19/29

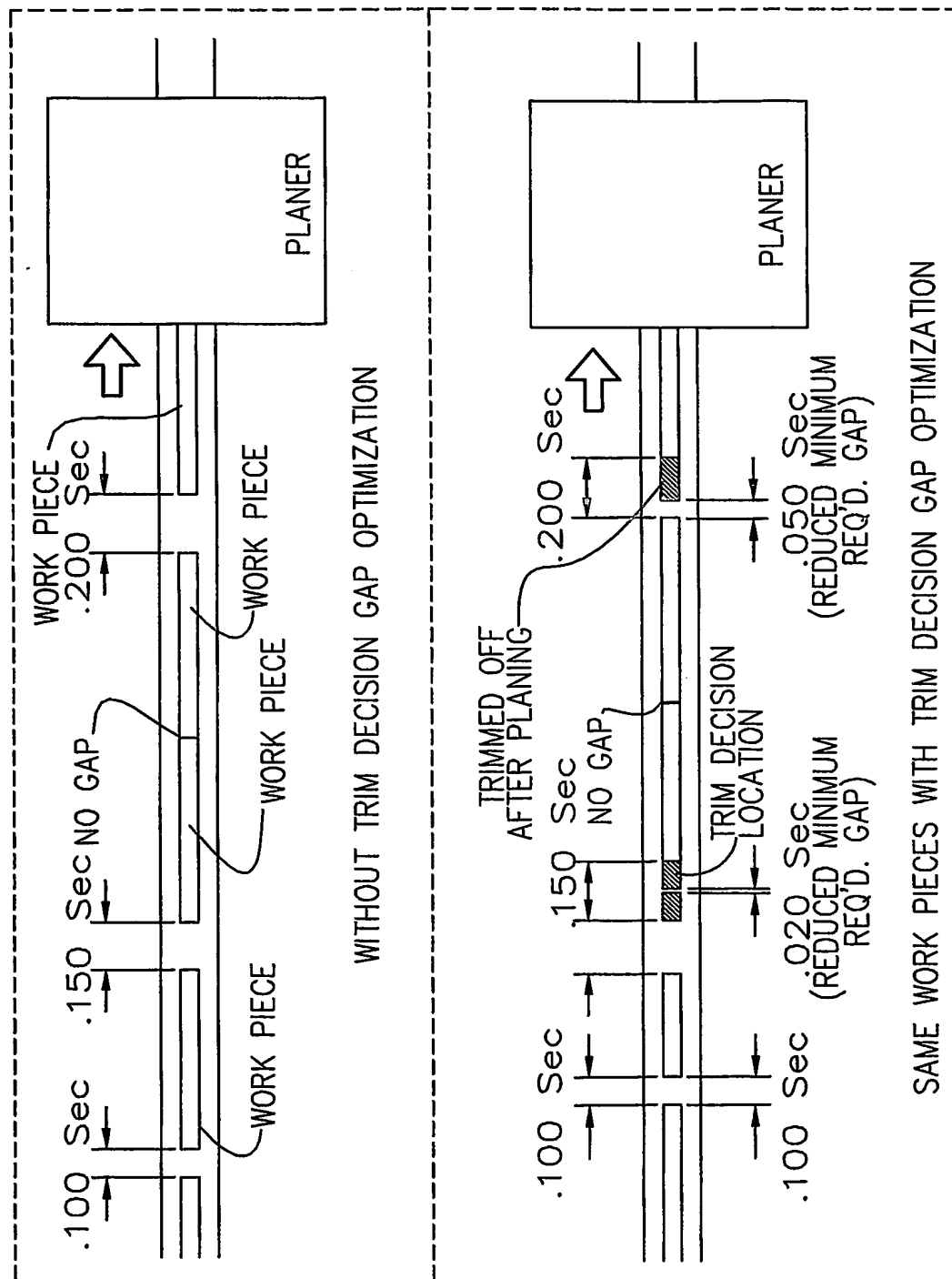


Fig 23

EXAMPLE OF FULLY OPTIMIZED GAP CONTROL
(WITH AND WITHOUT THE ADDITION OF TRIM DECISION GAP OPTIMIZATION)

20/29

		SHEET FEEDER	FIXED SPEED LUG TRANSFER	VARIABLE SPEED LUG TRANSFER	FIXED SPEED TAD	VARIABLE SPEED TAD	VERTICAL AD	FIXED SPEED LAD	VARIABLE SPEED LAD	FIXED SPEED ITD	VARIABLE SPEED ITD	FIXED SPEED PLANNER	VARIABLE SPEED PLANNER	LINEAR WPI	TRANSVERSE WPI	WPS	OLNO	CLNO	CLO
1	X							X		X		X		X			X		
2	X							X			X	X		X		X		X	
3	X							X			X	X		X		X			X
4	X							X			X		X	X		X		X	
5	X							X			X		X	X		X		X	
6	X								X	X		X		X		X		X	
7	X								X	X		X		X		X		X	
8	X								X	X			X	X		X		X	
9	X								X	X			X	X		X		X	
10	X								X		X	X		X		X		X	
11	X								X		X	X		X		X		X	
12	X								X		X		X	X		X		X	
13	X								X		X		X	X		X		X	
14	X						X	X		X		X		X			X		
15	X						X	X			X	X		X		X		X	
16	X						X	X			X	X		X		X			X
17	X						X	X			X		X	X		X		X	
18	X						X	X			X		X	X		X		X	
19	X						X		X	X		X		X		X		X	
20	X						X		X	X		X		X		X		X	
21	X						X		X		X	X		X		X		X	
22	X						X		X		X	X		X		X			X
23	X	X						X		X		X			X		X		
24	X	X						X			X	X			X	X		X	
25	X	X						X			X	X		X		X		X	
26	X	X						X			X		X		X			X	
27	X							X			X		X	X		X		X	
28		X						X				X			X		X		
29		X						X		X		X			X		X		
30		X			X			X		X		X			X		X		
31		X			X			X				X			X		X		
32		X						X			X	X			X	X		X	
33		X			X			X				X			X	X		X	
34			X					X				X			X	X		X	
35			X					X				X			X	X			X
36			X		X			X				X			X	X		X	
37			X		X			X				X			X	X			X
38			X			X		X				X			X	X		X	
39			X			X		X				X			X	X			X
40			X						X			X			X	X		X	
41			X						X			X			X	X			X
42			X					X			X	X			X	X		X	
43			X					X			X	X			X	X			X
44			X					X			X		X		X	X		X	

Fig 24

SUBSTITUTE SHEET (RULE 26)

21/29

CONTINUATION OF

Fig 24

	SHEET FEEDER	FIXED SPEED LUG TRANSFER	VARIABLE SPEED LUG TRANSFER	FIXED SPEED TAD	VARIABLE SPEED TAD	VERTICAL AD	FIXED SPEED LAD	VARIABLE SPEED LAD	FIXED SPEED ITD	VARIABLE SPEED ITD	FIXED SPEED PLANNER	VARIABLE SPEED PLANNER	LINEAR WPI	TRANSVERSE WPI	WPS	OLNO	CLNO	CLO
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
45			X				X			X		X		X	X		X	X
46			X	X				X	X		X			X	X		X	X
47			X	X				X	X		X			X	X		X	X
48			X	X				X	X		X			X	X		X	X
49			X	X				X	X		X			X	X		X	X
50			X	X				X	X		X	X		X	X		X	X
51			X	X				X	X		X	X		X	X		X	X
52			X		X		X		X		X			X	X		X	X
53			X		X		X		X		X			X	X		X	X
54			X		X			X	X		X			X	X		X	X
55			X		X			X	X		X			X	X		X	X
56			X		X			X	X	X	X			X	X		X	X
57			X		X			X	X	X	X			X	X		X	X
58			X		X			X		X		X		X	X		X	X
59			X		X			X		X		X		X	X		X	X
60		X				X	X				X			X		X		
61		X				X	X		X		X			X		X		
62		X				X	X			X	X			X	X		X	
63		X				X		X		X	X			X	X		X	
64		X				X		X		X	X			X	X		X	X
65		X				X		X		X		X		X	X		X	X
66		X				X		X		X		X		X	X		X	X
67			X			X	X				X			X	X		X	X
68			X			X	X				X			X	X		X	X
69			X			X	X		X		X			X	X		X	X
70			X			X	X		X		X			X	X		X	X
71			X			X		X	X		X			X	X		X	X
72			X			X		X	X		X			X	X		X	X
73			X			X		X		X				X	X		X	X
74			X			X		X		X				X	X		X	X
75			X			X		X		X				X	X		X	X
76			X			X		X		X		X		X	X		X	X
77			X			X	X			X		X		X	X		X	X
78			X			X	X			X		X		X	X		X	X
79			X			X			X			X		X	X		X	X
80			X			X			X			X		X	X		X	X
81			X			X	X			X	X			X	X		X	X
82			X			X	X			X	X			X	X		X	X
83			X	X			X		X		X			X	X		X	X
84			X	X			X			X	X		X		X		X	X
85			X	X			X			X	X		X		X		X	X
86			X		X		X			X	X		X		X		X	X
87			X		X		X			X	X		X		X		X	X
88			X		X			X			X		X		X			X

SUBSTITUTE SHEET (RULE 26)

22/29

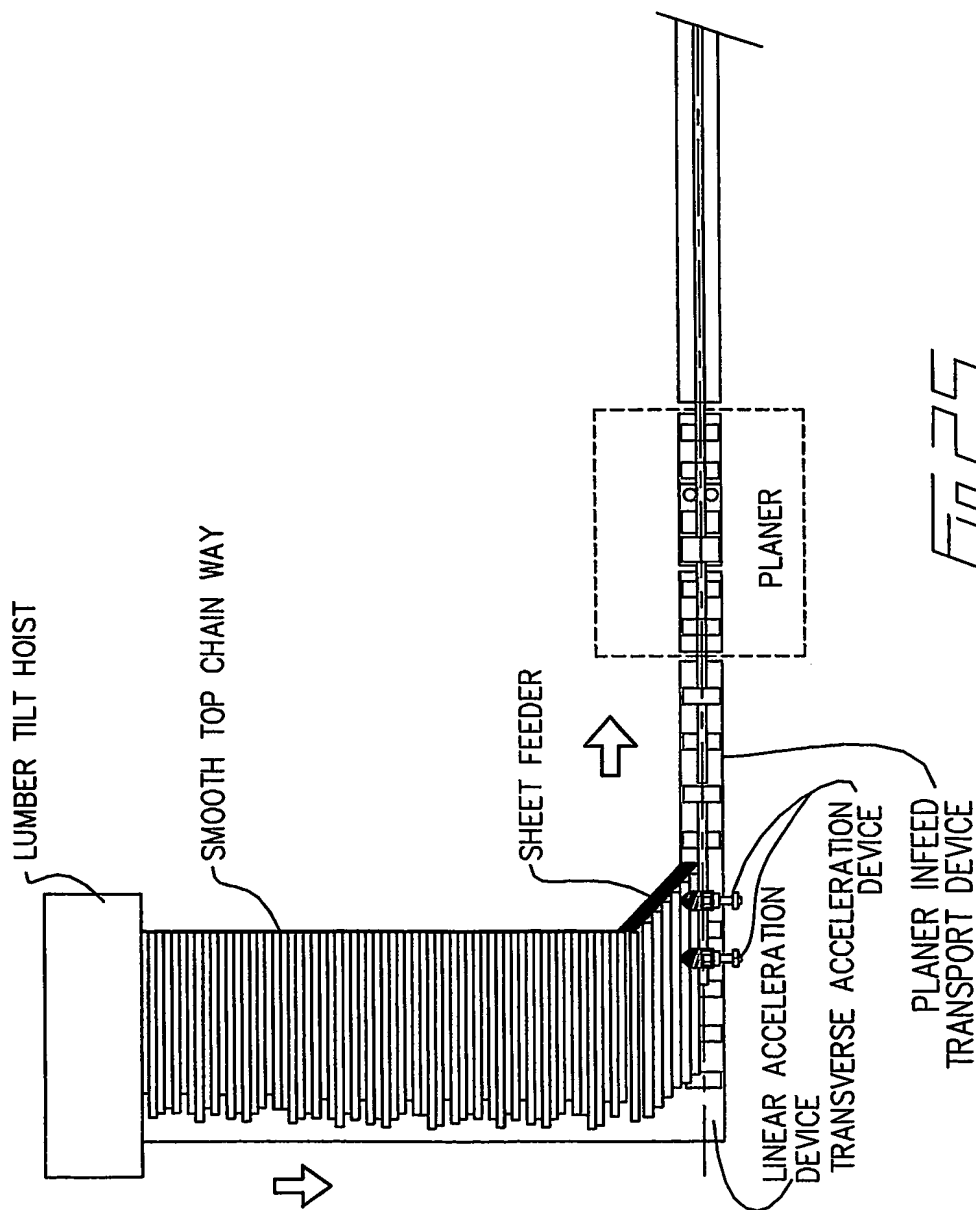


Fig 25
CONVENTIONAL PLANER INFED SYSTEM—SHORT INFED TRANSPORT DEVICE
(BEFORE CONVERSION TO OPTIMIZED SYSTEM)

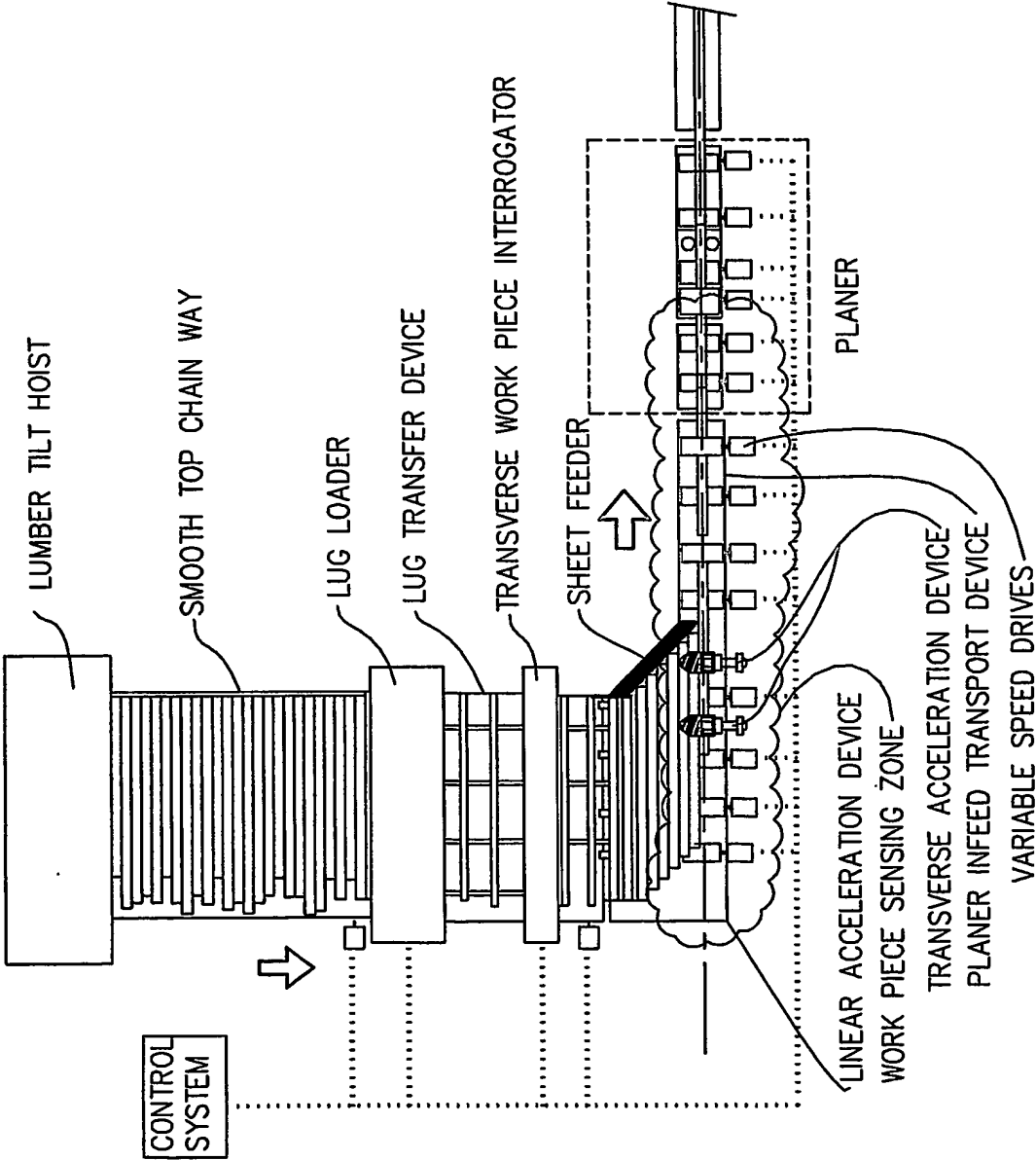


Fig 26

CONVENTIONAL PLANER INFED SYSTEM—SHORT INFED TRANSPORT DEVICE
(AFTER CONVERSION TO OPTIMIZED SYSTEM)

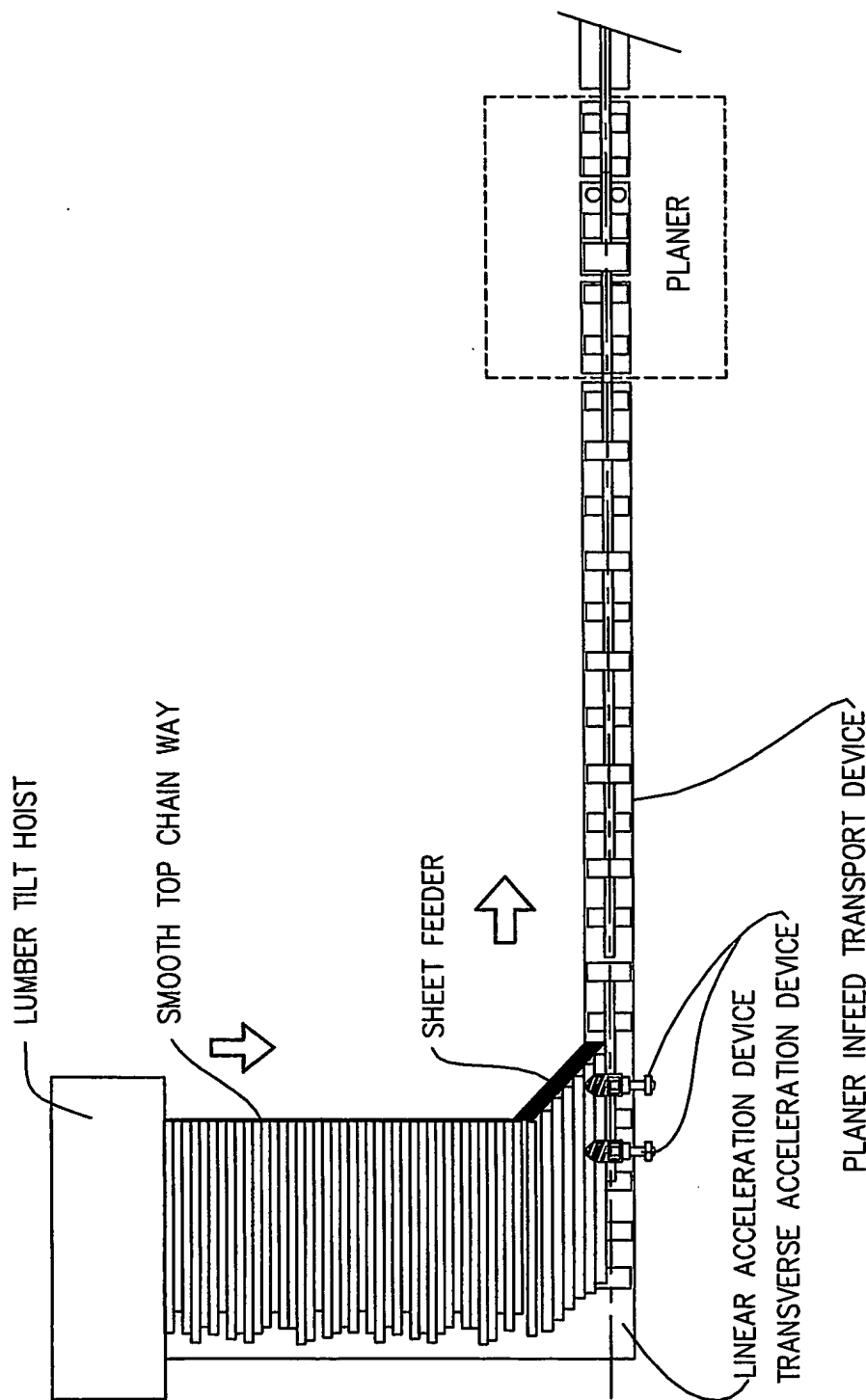


Fig 27

CONVENTIONAL PLANER INFED SYSTEM—LONG INFED TRANSPORT DEVICE
(BEFORE CONVERSION TO OPTIMIZED SYSTEM)

25/29

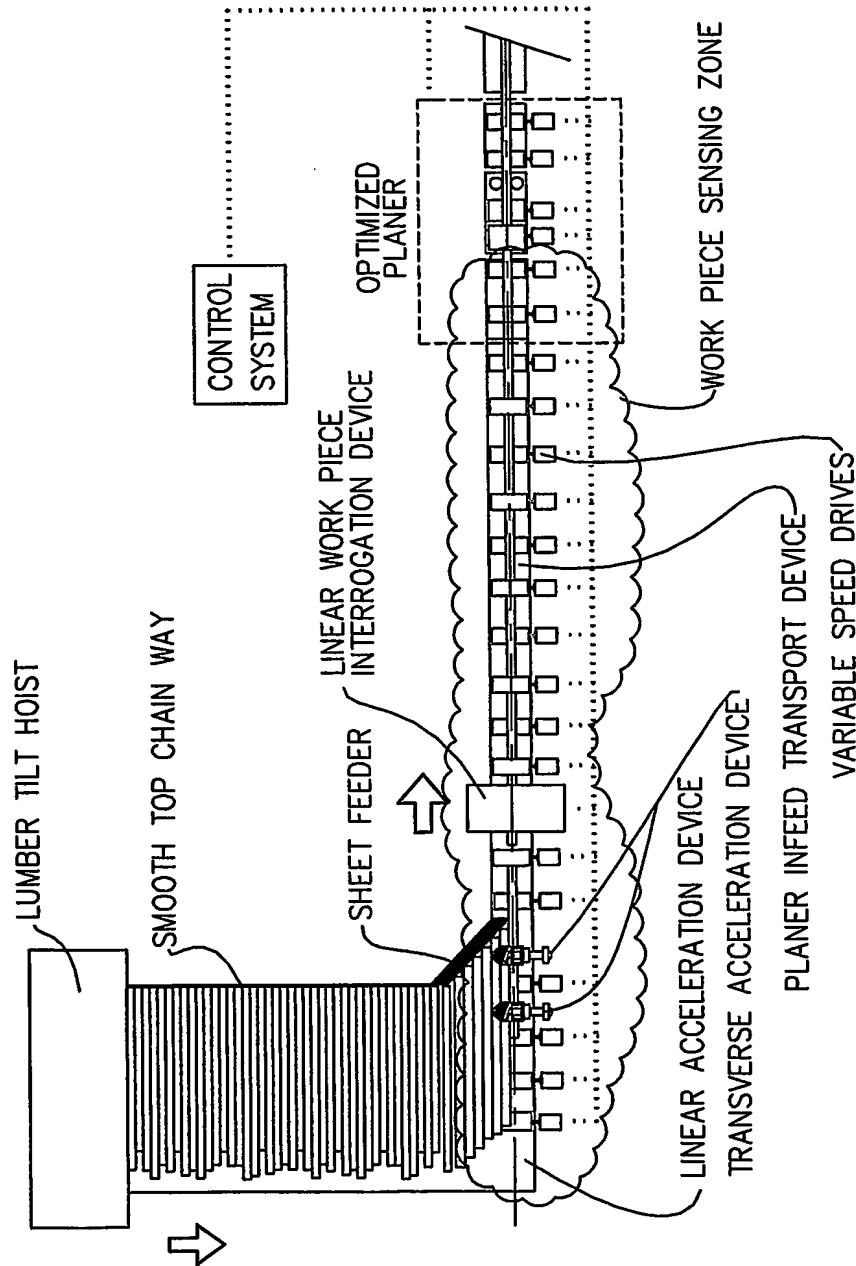
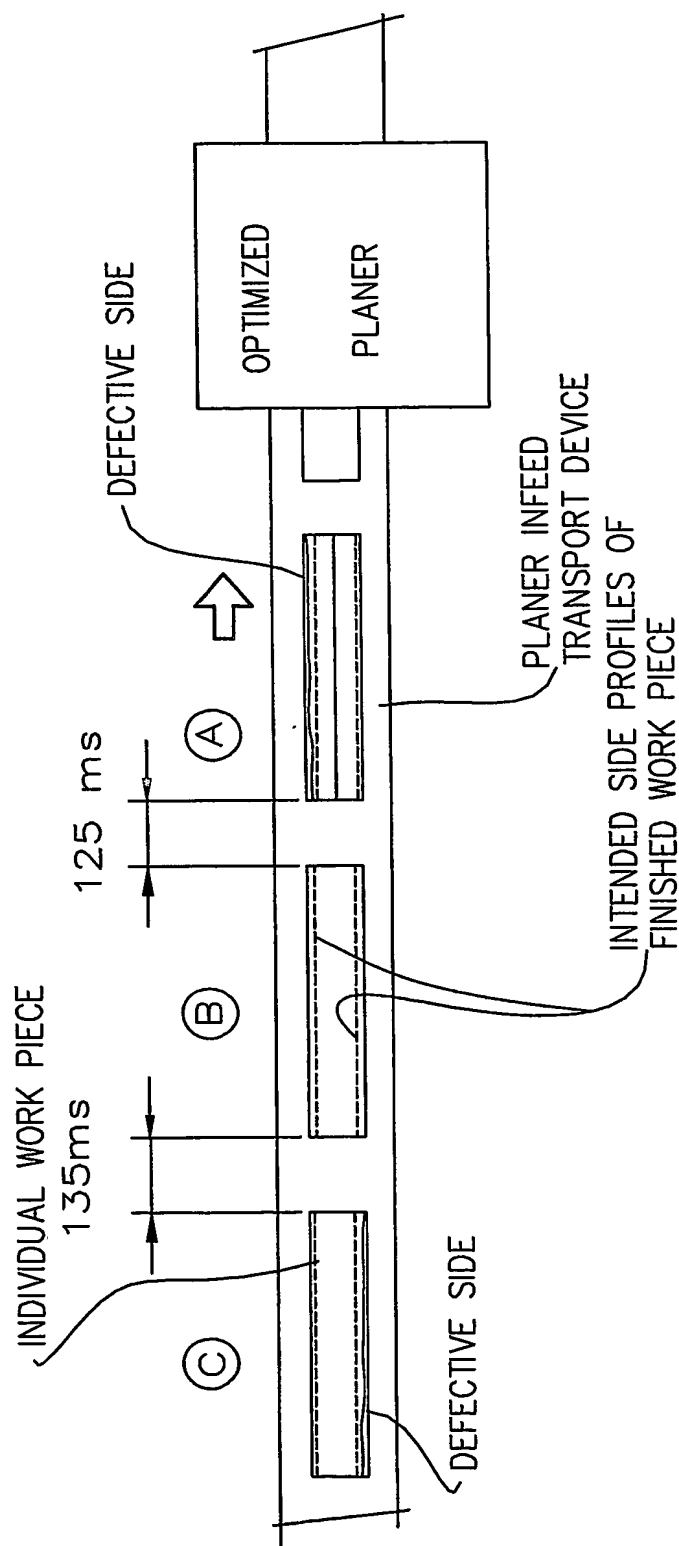


Fig 2B

CONVENTIONAL PLANER INFED SYSTEM—LONG INFED TRANSPORT DEVICE
AFTER CONVERSION TO OPTIMIZED SYSTEM)

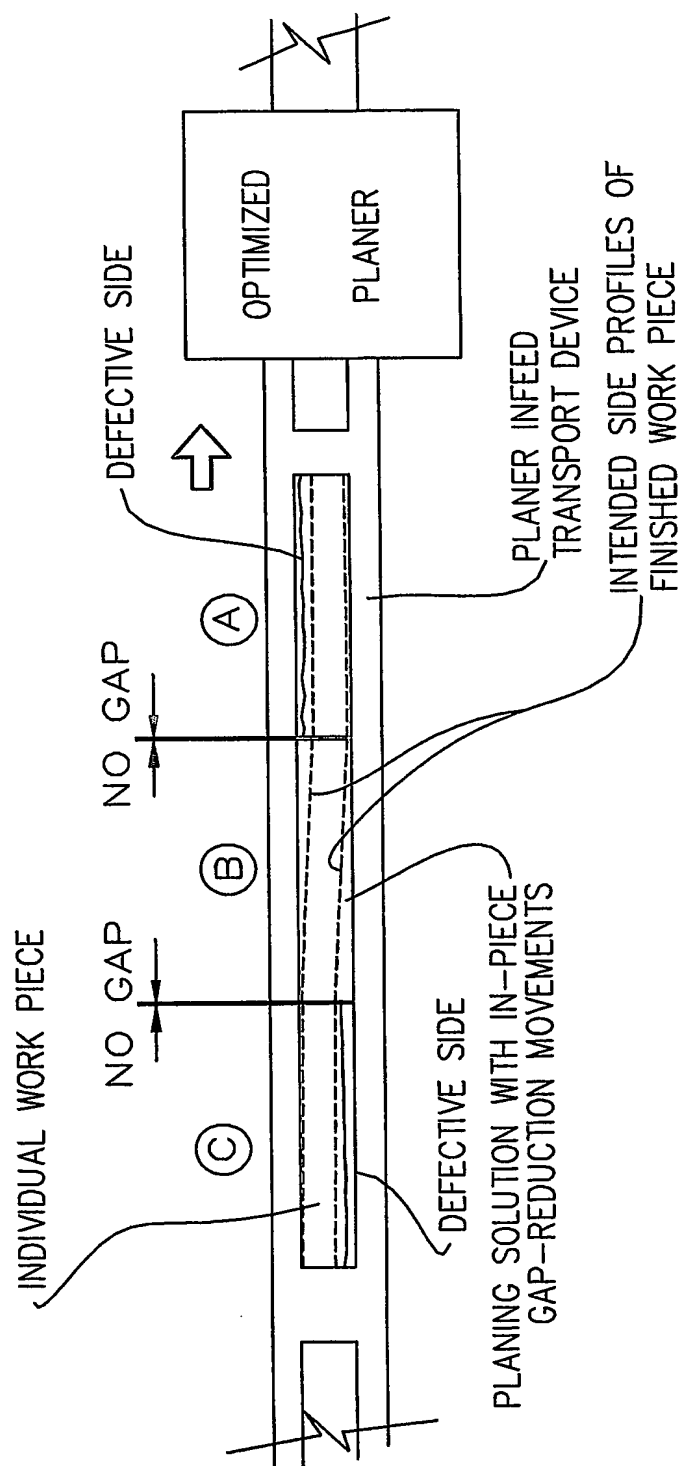
26/29



SUBSTITUTE SHEET (RULE 26)

Fig 29

OPTIMIZED GAPPING (WITHOUT IN-PIECE GAP-REDUCTION MOVEMENTS)



7930

OPTIMIZED GAPPING (WITH IN-PIECE GAP-REDUCTION MOVEMENTS)

28/29

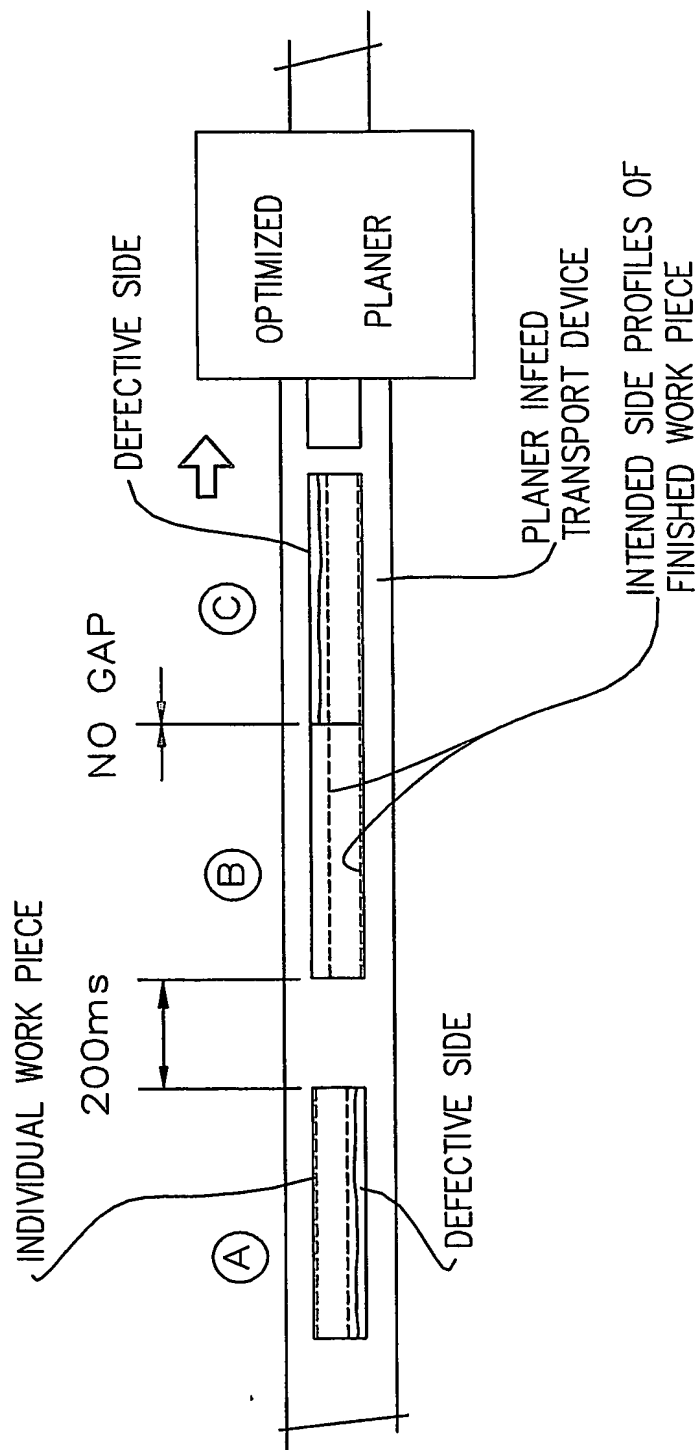


Fig 31

OPTIMIZED GAPPING (WITHOUT IN-PIECE GAP-REDUCTION MOVEMENTS)

29/29

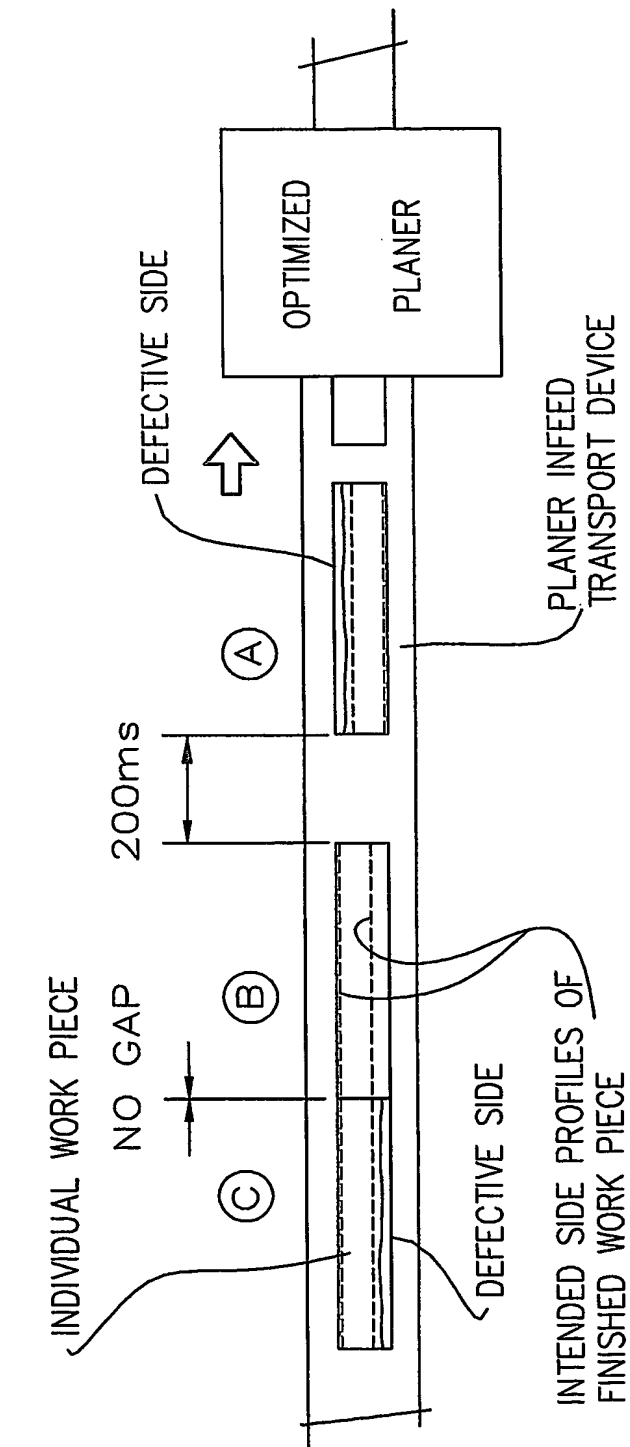


Fig 32
OPTIMIZED GAPPING (WITHOUT IN-PIECE GAP-REDUCTION MOVEMENTS)